

This calculator skills unit contains:

- estimation
- basic operations and percentage
- memory functions
- repeated calculation functions

Estimation

You use calculators to make calculations easier and faster. Calculators allow you to do calculations which may take much longer if we were to do them with pen and paper.



*The calculator is a useful tool,
but it only follows your instructions*

A calculator will not make decisions for us; so if you make a mistake, the calculator will too. A calculator like all methods of calculation requires you to think, plan and estimate.

Your use of a calculator should be supported by good estimation and approximation skills.

You make intelligent guesses or estimates all the time - you estimate how long it will take to get to work, how much money you need for a holiday, etc. Try to get into the habit of doing an estimate every time you use a calculator to work out an accurate answer.

Estimation of a calculator answer will help you:

- make sense of the calculator answer;
- know what to expect of the calculator answer;
- check your calculator answer.



Get into the habit of doing a quick estimate for every problem you want to work out on the calculator.

Try some estimating

You may have to add 232 and 657:

When you key in the numbers and the + operation into your calculator, you get 152424.

Does this make sense?

Your estimation of 900 ($200 + 700$) lets you know that 152424 is not reasonable for the calculation you are doing. Perhaps you hit a wrong key; try the calculation again. Now you should get an answer of 889 and, this does make sense.

Another example?

What is your annual income if you receive a gross wage of \$389 a week?

This problem requires you to work out $\$389 \times 52$ (52 weeks in a year).

Try an estimate first:

389 could be rounded to 400 and 52 could be rounded to 50.

So, $389 \times 52 \approx 400 \times 50$ or 20 000

Now when you get 20 228 on your calculator, it makes sense because it is what you expected.



Estimation should be quick and easy. Round numbers so they are easy to calculate with but still give you an estimate close enough to the actual numbers to be useful.

Don't stop thinking when you use your calculator. The calculator can't think so someone has to.

Estimating with decimals

When estimating with decimals, round them to numbers that are approximately the same but easy to work with.

Have a look at an example: $14.32 - 11.95$

To estimate an answer, round 14.32 to 14.5 and 11.95 to 12.

$$14.5 - 12 = 2.5$$

Now use your calculator. The exact answer is 2.37.

Another example? $79.56 \div 9.8$

Your estimate could be 8 (from $80 \div 10$).

The calculator will give you 8.1183673.

You need to work out a bill for :

2 items at \$3.99 each and 5 items at \$1.15 each.

Round \$3.99 to \$4 and \$1.15 to \$1.

Now estimate: $\$4 \times 2 + \1×5 .

Your estimate of \$13 supports your calculator answer of \$13.73.

Estimating percentage

This is a little more difficult, but it's still possible to get some idea of the answer you expect from your calculator.

An example might help. You need to find 30% of \$320.

All of \$320 is 100%, half is 50% and a quarter is 25%

100% of \$320			
50% of \$320 (\$160)			
25% or (\$80)			

30% is a bit more than a quarter.

Because a quarter is \$80, your answer should be a bit more than this. On the calculator you should get \$96.



Activity 1

- 1 Give estimated answers only for the following:
(don't use a calculator or work exactly for these)

a) $159 + 321$

c) 27×5

b) $732 - 499$

d) $299 \div 47$

- 2 Pick the best estimate for each of these calculations:

a) 54×79 400 4000 40 000

b) $3256 - 53$ 3000 2200 3200

c) 6.85×14.7 60 80 100

d) 5 items at \$2.25 each and 3 items at \$8.99 each
\$40 \$30 \$50

e) Find 65% of \$250
\$120 \$150 \$200

f) $\$4.85 + \12.35×3
\$40 \$100 \$200

g) Lunch for four people costs \$35.80. If they divide the bill
equally, they each pay about
\$7 \$9 \$16

Activity 1 Answers

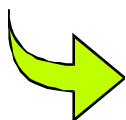
- | | | | | | |
|---|----|---------------|---|----|-------|
| 1 | a) | about 450-480 | 2 | a) | 4000 |
| | b) | about 200-230 | | b) | 3200 |
| | c) | about 125-150 | | c) | 100 |
| | d) | about 6-7 | | d) | \$40 |
| | | | | e) | \$150 |
| | | | | f) | \$40 |
| | | | | g) | \$9 |

Like to do more work on your estimating skills? See the **Calculation A** skills unit.

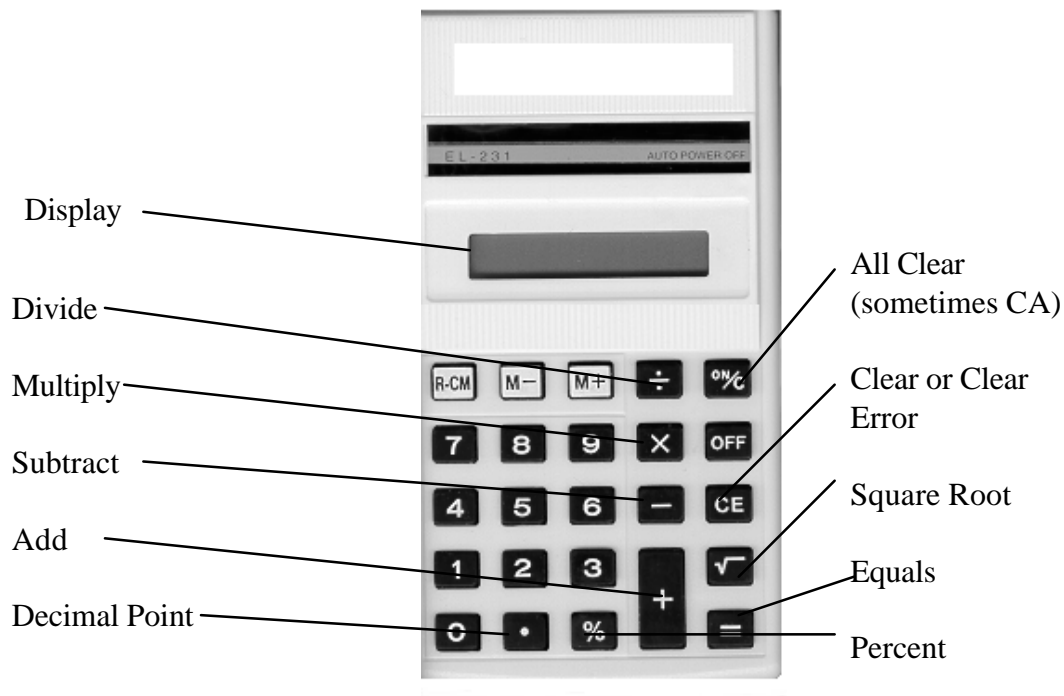
Basic Operations

There are two main types of calculators:

Arithmetic calculators & ***Scientific calculators***

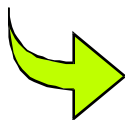


Arithmetic calculators do basic calculations: they add, subtract, multiply and divide whole numbers and decimals, as well as work out percentages and square roots.





Check your own calculator and see if you can find these same keys.

Calculators are all a bit different, so you need to **get to know your own calculator and practise using it.**










To get correct answers you will need to be accurate and **press the calculator keys in exactly the right order.**

You should press  (All Clear, sometimes called ) before you start any calculation. This clears any numbers that might have been left from the last calculation

To work out $4 + 12$

Press:

						
↑						↑
(to clear)						(read out)

To work out $28 - 19$

Press:        



Use a calculator to work out the following, but remember to estimate first:

- 1
 - a) $18 + 7$
 - b) $47 + 39 + 623$
 - c) $8 + 73 + 264 + 3208$
- 2
 - a) $17 - 8$
 - b) $134 - 59$
 - c) $3051 - 632$

Activity 2 Answers

1 a) 25
b) 709
c) 3553

2 a) 9
b) 75
c) 2419

Working with multiplication (times), x

To work out 284×16

Press:         

Working with division, ÷

To work out $3168 \div 12$. This may look like $12 \overline{)3168}$

Press:          

**Activity 3**

Use your calculator to calculate:

1 a) 65×7

2 a) $150 \div 15$

b) 231×15

b) $560 \div 16$

c) 2160×342

c) $43 \overline{)2752}$






Did you estimate first?

Activity 3 Answers

1 a) 455
 b) 3465
 c) 738 720

2 a) 10
 b) 35
 c) 64


Using the clear keys:

There are two clear keys  and 
 (sometimes called ).  clears
 everything from the calculator but  only
 clears the last number you have pressed.


For example:

Suppose you need to add $32 + 54 + 16 + 27$ but by accident you key in 45 instead of 54. If you press the keys in the order shown you will get the right answer:

Press:           
     

However, if you press  after a mistake, you will have to start the calculation all over again.

Working with decimals

Decimals can be worked out on the calculator using  for the **decimal point**.

But remember to estimate first.


To add, $6.7 + 4.5$

Press:          

To subtract, $24 - 3.72$

Press:          

To multiply, 3.14×1.6

Press:           

To divide, $16.768 \div 6.4$ can be written $6.4 \overline{)16.768}$

Press:             

Practise these on your own calculator.

**Activity 4**

More examples for you to work out on your calculator:

1 $21.23 + 59$

2 $120.9 - 78.45$

3 31.3×2.74

4 $2.375 \div .05$

5 $3.27 + 6.3 + 12.25 - 8.95$

6 $8 \times 15.925 - 37.8$

7
$$\frac{253.80 - 179.95}{6.6}$$

Activity 4 Answers

1 80.23

2 42.45

3 85.762

4 47.5

5 12.87

6 89.6

7 11.189 (to 3 decimal places)

**Remember:**

- if you enter .5 into your calculator, it will show as 0.5
- if you enter .50 into your calculator, it will show as 0.5
- for money, the calculator does not know that we need to show two numbers after the decimal point (for the cents)
e.g. \$2.65 x 4 the calculator gives an answer of 10.6, you need to read this as \$10.60
- the decimal point is always displayed on the calculator, even when you don't use it, ie. when you're only using whole numbers
- if you are doing a division that has a remainder, the calculator will show the left over as a decimal. For example: $7 \div 3$






 2.333333

(See the **Calculation A** skills unit for more information.)

Working with percentage, %

To find a percent always put the amount in first, then use the percent key.

For example:




a) 25% of \$14

Press:        (no need to press =)

The calculator shows 3.5. The answer should be written as \$3.50.

(b) Find $12\frac{1}{2}\%$ of \$20 (the decimal form of $12\frac{1}{2}$ is 12.5)

See the **Calculation B** skills unit for fraction to decimal conversion.

Press:          

ie. the answer is \$2.50

Percentage discount

A compact disc priced at \$30 is on sale. If the discount is 20%, what do you pay?

Press:         

You pay \$24.

Percentage mark-up or sales tax

The marked price of a camera is \$250, but you need to pay 20% sales tax. How much do you pay for the camera?

Press:          

You will be charged \$300.



**Activity 5**

- 1
 - a) Find 15% of \$350
 - b) Find $7\frac{1}{2}\%$ of \$72
- 2 How much would you pay for these items costing:
 - a) \$56 with 25% discount
 - b) \$175 with $12\frac{1}{2}\%$ discount
- 3 You buy a shirt from the maker for \$50. What will you charge a customer if a 15% mark-up is applied?
- 4 A bike costing \$234 needs to have $7\frac{1}{2}\%$ sales tax added to the price. How much will the customer pay?

**Activity 5 Answers**

- | | | | | |
|---|----|----------|---|----------|
| 1 | a) | \$52.50 | 3 | \$57.50 |
| | b) | \$5.40 | 4 | \$251.55 |
| 2 | a) | \$42 | | |
| | b) | \$153.15 | | |

(Note the answer on the calculator for this was 153.125. However, since it is money, it must be rounded to two decimal places, ie. 153.13 and because our smallest coin is now 5 cents, we must round the 13 cents up to 15 cents.)

Memory Functions



recalls what is in memory
(RCM on this calculator)



adds to what is in memory




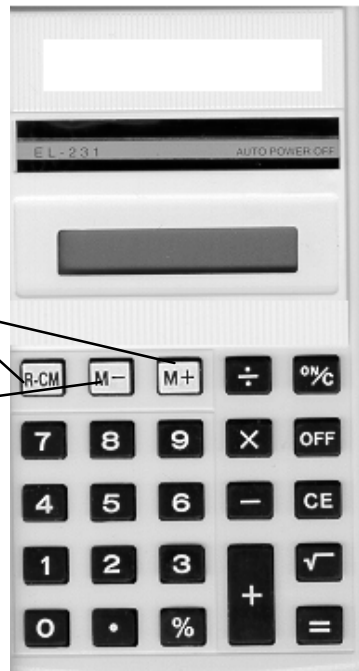
subtracts from what is in
memory


and, on some calculators,



clears memory

(otherwise use  to
clear memory)



Check your own arithmetic calculator to locate the memory functions. If you are using a scientific calculator, you should have an extra key - a  (memory in key) - and the key for clearing the memory will be different.

Using M+ and MR



*memory keys are useful if you
need to do a series of steps to
work out a problem*

For example, you may want to add up these items from the supermarket:

- 1 packet of biscuits costing \$2.15
- 3 bottles of softdrink costing 95 cents each
- 4 loaves of bread costing \$1.60 each

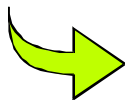
The three separate costs need to be worked out first: the cost for the biscuits, cost for the softdrink and cost for bread, and then added together.

You can first multiply to find the costs and then add them in memory, ie. $(\$2.15 \times 1) + (\$0.95 \times 3) + (\$1.60 \times 4)$






Press:           
         

This gives the total amount as \$11.40.





Some tips you may find useful:

- note that when you press the  key a M appears on the screen.
-  clears the memory. If you don't press  the numbers in memory from the last calculation will be added to the next question.
- to enter 95 cents, you need to press the  before the 95, otherwise the calculator reads it as \$95
- if there is only one article, you don't have to multiply by 1. Just enter the price and press .

Using M-

A woman was being paid \$21.50 per hour for 8 hours of work. Out of that she has to pay 10 hours of child care at \$6.35 per hour. How much money has she left?

You need to work out her total pay then subtract the total child care.

$$\text{ie. } (\$21.50 \times 8) - (\$6.35 \times 10)$$

total pay total childcare

Press:           
     

Your answer should be \$108.50

**Activity 6**

- 1 Calculate these totals using M+
 - a) 2 notebooks at \$1.95, 1 pen at \$6.00, 4 cards at \$2.05
 - b) 5 items at 85 cents, 4 items at \$20.80, 2 items at \$99.95
 - c) 3 items at \$7.95, 12 items at \$19.99, 1 item at \$2.09
- 2 Use the M- button to solve these problems:
 - a) From the amount of \$20 you need to buy 3 pens costing \$1.80 each. How much will you have left?
 - b) You are making cakes for a market stall. If you sell 15 for \$8.50 each and they cost \$3.25 to make, how much profit do you make?

Activity 6 Answers

- | | | | | | |
|---|----|----------|---|----|---------|
| 1 | a) | \$18.10 | 2 | a) | \$14.60 |
| | b) | \$287.35 | | b) | \$78.75 |
| | c) | \$265.82 | | | |

Repeated Calculation Functions

















Don't worry about having to do the same operation over and over again. Most calculators have easy ways for dealing with this.

One example:

If you have to **add 15** to a lot of different numbers

Press:      the number and 

So, to add 15 to 30, 45 and 75:

Press:        
  
  

Your answers should be 45, 60, 90.

Don't press the AC button at the start of each addition as you usually do or you will cancel the repeated program.



Remember:

- to estimate your answers;
- not to press the AC button until you finish the series of additions;
- the calculator will also do repeated multiplication, subtraction and division in the same way.

Try a few repeated function examples:
















- 1 Apply a 50% mark-up to the following items:

jaffle maker priced at \$27

bread maker priced at \$55

toaster priced at \$21.

(new price will be old price x 1.5 ie. 100% + 50%)















Press:         
  
  

Your answers should be \$40.50, \$82.50, \$31.50.

For most calculators, for repeated subtraction and division you key in the number you are taking away or dividing by first.

- 2 Reduce the cost of all electric drills by \$25.

What is the sale price of drills priced at \$209, \$99.80, \$157 and \$126.90?

Press:         
    

and so on until you have entered all the amounts.

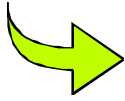
Your answers should be \$184, \$74.80, \$132, \$101.90.

- 3 Share the cost of the monthly printing bills between three departments if the printing bill for January is \$568, for February is \$621 and for March is \$472.

Press:        

.....

Your answers should be \$189.33, \$207, \$157.33.



Some calculators have different ways for working out repeated calculations.

- **check** your calculation instruction book;
- **experiment** and,
- **practise, practise, practise!**



Activity 7

- 1 For each of the amounts \$4.20, \$12.00, \$35.50, \$100 and \$159.90:
 - a) add \$15.50
 - b) multiply by 2.5
 - c) subtract \$3.65
 - d) divide by 5

- 2 Your shop is holding a half-price sale. What would you charge customers buying articles marked at \$23, \$14.50, \$49.90, \$72.20, \$119, \$499.90?
(Hint: 50% off is half price, so use the repeated function of dividing by 2)

- 3 \$5 is taken off the price of certain goods for one day only. How much would you pay for items worth \$32, \$48.85, \$57.95, \$114, \$151.75, \$201.65?

- 4 You hold a charity stall and need to mark up goods by 15%. You can do this by using repeated multiplication by 1.15. What price do you put on items that cost you \$5, \$7.50, \$10, \$15, \$22.50 and \$36.80?

Activity 7 Answers

- 1
 - a) \$19.70, \$27.50, \$51.00, \$115.50, \$175.40
 - b) \$10.50, \$30.00, \$88.75, \$250.00, \$399.75
 - c) \$0.55, \$8.35, \$31.85, \$96.35, \$156.25
 - d) \$0.84, \$2.40, \$7.10, \$20.00, \$31.98
- 2 \$11.50, \$7.25, \$24.95, \$36.10, \$59.50, \$249.95
- 3 \$27.00, \$43.85, \$52.95, \$109.00, \$146.75, \$196.65
- 4 \$5.75, \$8.63 (8.625), \$11.50, \$17.25, \$25.88 (25.875), \$42.32

**Test yourself on this skills unit**

- 1 Choose the best estimate for:
 - (i) 321×27 6000 7500 9000
 - (ii) The total cost for 3 books at \$12.95 each and 6 cards at \$2.95 each. \$50 \$60 \$70
 - (iii) Find 30% of \$25 \$7 \$10 \$15
- 2 Use your calculator to find the answers for:
 - (i) $34 \times 25 \div 15.5$
 - (ii) $\$12.55 + \$23.60 + \$149.35$
 - (iii) At a 15% off sale, what would you pay for a pair of jeans normally costing \$105?
- 3 Use the memory keys on your calculator to work out:
 - (i) the total cost of 3 CDs at \$24.95, 4 video tapes at \$4.95 each and 2 cassette tapes at \$3.95 each.
 - (ii) how much do you have left from a weekly allowance of \$30 if you need to buy 9 bus rides at \$1.50 each and 5 train rides at \$2.95 each.
- 4 Use the repeated calculation function on your calculator to work out:
 - (i) The store where you work is having a 10% off sale. What would the first 6 customers pay if they buy items marked at \$4.95, \$17.50, \$25, \$37.75, \$49.95 and \$3.75?
(Don't forget to round to the nearest 5 cents.)
 - (ii) Christmas wrapping costs an extra \$3.75. What would customers pay for wrapped gifts costing \$12.50, \$20.65, \$24.95, \$9.90, \$35.25 and \$149.85?

Test yourself on this skills unit Answers

- | | | |
|---|-------|---|
| 1 | (i) | 9000 |
| | (ii) | \$60 |
| | (iii) | \$7 |
| 2 | (i) | 54.8387 |
| | (ii) | \$185.50 |
| | (iii) | \$89.25 |
| 3 | (i) | \$102.55 |
| | (ii) | \$1.75 |
| 4 | (i) | \$4.45, \$15.75, \$22.50, \$34.00, \$44.95, \$3.40 |
| | (ii) | \$16.25, \$24.40, \$28.70, \$13.65, \$39.00, \$153.60 |